| Lecture | Topics |
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| 1 | Introduction to Computers,<br>Turing Machine, C++, C++ Code Structure, Scope of Variables & Memory Allocation, Command Line Arguments, Coding Convention, Functions & Methods, C++ Modules, OOP, C++ Dtat Types, C++ Operators, Control Flow, C++ STL, I/O Streams, C++ Function Templates, Inheritance & Polymorphism, etc. |
| 2 | Review of Software Development,<br>Structured Programming,<br>Functions & Methods, C++ Modules,<br>Overview of OOP, set/get methods,<br>Constructor/Destructor |
| 3 | C++ Languang syntax - coding through C++ language<br>OOP concept is language independent<br>array, vector, pointers, references, loop, control flow,<br>data types, arithmetic operators, logical operators<br>C++ 'this' pointer<br>'static' keyword<br>sorting algorithms |
| 4 | function in C++<br>storage classes and duration<br>function call stack & activation record<br>function templates<br>Standard Template Library<br>recursion<br>recap: C++ pointer and reference, control structures,<br>repetition statements<br>arrary class template<br>vector class template |
| 5 | uses of 'static' in various situatons<br>big O notation, efficiency of an algorithm<br>sort & search<br>'pointor' operator, 'address of' operator<br>sizeof operator<br>introduction to exception-handling |

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| 6 | C++ class, a deeper look<br>operator overloading<br>inheritance<br>polymorphism<br>constructor & destructor<br>composition<br>friend function and friend classes<br>dynamic memory management<br>create a custom array class |
| 7 | 'cast' operator<br>conversion constructor<br>Inheritance<br>polymorphism<br>recap: operator overloadiing subjects |
| 8 | inheritance hierarchy<br>public, protected, private inheritance<br>polymorphism<br>virtual function & dynamic binding<br>virtual destructor |
| 9 | 'final' member function and class<br>abstract vs concret classes<br>pure virtual function<br>the triple indirection<br>make utility and make file<br>Standard Template Library (STL)<br>Containers and Iterators |
| 10 | common iterator functions<br>types of iterators<br>iterators with sequences<br>vector, deque, list<br>associative containers<br>container adapters |
| 11 | C++ Standard Library Algorithms<br>Algoithm, Iterator, Container |
| 12 | Design Patterns,<br>the final project |
| 13 | the final project |

Reading Assignments

C++ How to Program Chapter 1, and class study material

C++ How to Program Chapter 2, 3, and class study material

C++ How to Program Chapter 3, 4, and class study material

C++ How to Program Chapter 5, 6, and class study material

C++ How to Program Chapter 7, 8, and class study material

C++ How to Program Chapter 9, 10, and class study material

C++ How to Program Chapter 11, and class study material

C++ How to Program Chapter 12, and class study material

C++ How to Program Chapter 15, and class study material

C++ How to Program Chapter 16, and class study material

C++ How to Program Chapter 13, 14, and class study material

class study material